

**Golder Associates**

CONSULTING GEOTECHNICAL AND MINING ENGINEERS

June 17, 1987

Our ref: 843-1360.001
COLB/30State of Washington
Dept. of Ecology
Mailstop PV-11
Olympia, WA 98504**ATTENTION: Fred Gardner****RE: RESPONSE TO QUESTIONS ON THE COLBERT LANDFILL REMEDIAL
INVESTIGATION AND FEASIBILITY STUDY REPORTS**

Dear Mr. Gardner:

Golder Associates (GAI) and EnviroSphere are responding to questions from Dames and Moore (letter dated May 26, 1987) regarding the Remedial Investigation and Feasibility Study Reports for the Colbert Landfill. We hope our responses are helpful for their review.

Our responses are provided below and are referenced by question number. EnviroSphere provided responses to question numbers 1, 2, 3, 11, 12, 13 and 14; while GAI provided responses to question numbers 4, 5, 6, 7, 8, 9, and 10.

Question Number One: The recommended alternative included upgrading the public water supply system to correct low pressure problems, part of which were caused by adding the Colbert Extension in response to the groundwater contamination. In addition, future residences built within the area with the existing plume must be hooked up to the water system. Thus, the water system improvements are sized to correct existing problems and supply future residences.

The "immediate" and "long-term" needs plans were derived from the draft plan developed for the Whitworth Water District by Pacific Environmental Consultants (Attachment 1). We understand that a copy of the PEC report, "Water System Plan Update, Systems B and C, Preliminary Draft (March 1986)," has been provided to Jerry R. Neal of Lukins and Annis, legal counsel to Spokane County, who should be able to supply you a copy. We reviewed the cost estimates contained in this report at a level commensurate with the +50 to -30 percent accuracy sought.

Question Number Two: Approximately 30 to 50 of the 106 residences exist at this time. The total of 106 based on population projections and the number of lots which have been established. Transmission mains and hookups were included as capital costs because of the uncertainty of when such items would actually be constructed. Although they might be installed at a future date, the impact on the cost estimate for the desired +50 to -30 percent accuracy is negligible. The cost estimates were based on unit costs derived from the Pacific Environmental Consultant's report which were checked by our cost-estimating division.

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Question Number Three: We have enclosed a copy of the information sent to us detailing the costs incurred to date for constructing the Colbert Extension and hooking up affected residences (Attachment 2).

Question Number Four: Golder Associates did not determine the volume of contaminants that remain disposed in the landfill. Golder calculated the amount of 1,1,1-trichloroethane (TCA) that was accountable as dissolved solute in the groundwater flow systems. This was calculated by determining the mass of TCA in each aquifer from Figures 5-27 and 5-21 of the Remedial Investigation Report. Porosity was assumed to be 25 percent. The saturated thickness of the upper sand/gravel and the lower sand/gravel aquifers were assumed to be 8 and 50 feet, respectively. Golder did not attempt to estimate the quantity of TCA that has volatilized.

Question Number Five: All groundwater quality data collected since 1980 for the targeted contaminants are presented in Appendix B of the Remedial Investigation Report. The data for the other targeted contaminants are not as complete as for TCA. Trends for other contaminants do not appear inconsistent with trends for TCA when sufficient data exists.

Question Number Six: Secondary DNAPL sources are believed to exist because:

- (1) High concentrations of contaminants have reached groundwater wells hydraulically up-gradient to the landfill (a known source). Wells that are further hydraulically up-gradient are not contaminated.
- (2) The soil gas survey conducted by EPA/Lockheed indicates that the highest concentrations in the near surface soils of volatile organic vapors exist hydraulically up-gradient to the landfill. For the geologic conditions indicated at this site, the soil gas concentrations are assumed to represent relative amounts of organic contaminants amenable to volatilization in the subsurface.
- (3) Pumping from up-gradient domestic wells and small irrigation wells was discounted as a mechanism because the pumping rates are not great enough to reverse groundwater flow below the landfill.

Golder has not conducted additional investigations to locate and define secondary sources. Golder believes that locating all secondary sources at this site is technically impossible.

The consultant-recommended remedial alternative places extraction wells in the lower sand/gravel - weathered basalt/Latah aquifer in the area where the highest concentrations of the contaminants exist. These wells (East System) will be pumped together with the West System to capture the more contaminated groundwater near the secondary sources. If the concentration of contaminants drop below the maximum contaminant level (mcl) in the West System, the possibility exists to turn off the West System and only operate the East System.